USGS
science for a changing world

Geographic Analysis and Monitoring Program

Climate Change Project

Statement of Problem

The eastern-third of the United States has experienced extensive land cover and land use changes over the past 300 years. Based on a growing body of evidence from scientific studies, land use change is now recognized as an important forcing factor for regional environmental change. One research hypothesis under study is that "historical land cover and land use changes have affected biophysical land surface processes and regional climate variability". Environmental simulation models, such as a regional land-atmospheric modeling system, represent key tools to investigate the potential effects and consequences of land use change. However, reconstructed historical land cover and land use datasets are critical requirements for such modeling studies. Reconstructed historical land cover and land use data sets need to be developed.

Objectives

(1) To develop reconstructed land cover and land use history datasets for the eastern-third of the U.S and for the years of 1850 and 1920. (2) To combine these reconstructed land cover and land use history data with a pre-European settlement natural vegetation scenario and contemporary land use data from the USGS NLCD in a format suitable for use in atmospheric mesoscale modeling sensitivity tests on the potential consequences of land use change. (3) Submit a manuscript to a peer-reviewed scientific journal for publication.

Relevance and Impact

Reconstructed land use history datasets will be developed and made available for use by the atmospheric and other environmental simulation modeling communities to investigate the potential effects of land use changes on land surface processes and regional climate variability. Reconstructed land use history datasets and research studies based on these data are integral to U.S climate change and global change research, as well as, studies concerned with human-induced changes to ecosystems. This research project directly contributes to the USGS GAM Program goals on the consequences of land use changes to climate variability and the development of long-term land use history for the U.S.

Strategy and Approach

The methodology involves the use of a GIS to analyze county-level U.S. census data, various ancillary spatial data, and extensive information from the literature concerning historical land cover and land use conditions in the 19th and 20th centuries. This project builds on prior research which has included the investigation of historical land cover and land use conditions in the eastern-third of the U.S. from pre-colonial vegetation conditions to the land cover and land use conditions of the 1990s. Historical land cover and land use change datasets were developed for land use change studies in South Florida. These consisted of a pre-1900s natural vegetation dataset and land use data for the 1990s based on Landsat TM-derived land cover and land use data.

For More Information

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